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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,455	02/05/2004	Akinobu Shimada	501.43495X00	2956

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EXAMINER

BARTON, JONATHAN A

ART UNIT PAPER NUMBER

2186

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/771,455

Applicant(s)

SHIMADA ET AL.

Examiner

Jonathan Barton

Art Unit

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☒ Claim(s) 12-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02/05/05</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 6,732,230) in view of Nambu (US 6,826,665).
 - a. As for claim 1 Johnson discloses a disk array apparatus comprising:
 - i. a host adapter for transferring data between a host system and the disk array apparatus (Col. 10 Lines 12-15 – The processor is a host, and it is in communication with the storage system, therefore a host adapter exists);
 - ii. a cache memory for storing data written from the host adapter (Fig. 3A Item 20, Col. 9 Lines 55-59, Col. 10 Lines 12-15);
 - iii. a storage device adapter for executing control to write data to the cache memory or to read data from the cache memory (Col. 10 Lines 20-27 – The associated computer processor acts as a SD adapter);
 - iv. a control memory to which control information is to be written by the host adapter and the storage device adapter (Fig. 3A Item 20, Col. 9 Lines

55-59, Col. 10 Lines 12-15 – Memory 20 acts as both a control memory and a buffer, additionally a separate buffer is disclosed but not pictured.);

v. a *plurality of storage devices* to which data are to be written on the basis of control by the storage device adapter (Col. 10 Lines 25-27, 37-53);

vi. a data movement control part provided in the storage device adapter (A specific data movement control part is not disclosed, but based on the data movement disclosed in Col. 10 Lines 25-27, 37-53 there is necessarily a data movement control part performing the disclosed data movement.),

vii. the host adapter creating a plurality of logical devices on the basis of storage areas of the plurality of kinds of storage devices and executing control to cause the plurality of logical devices to be objects to be accessed from the host system (Col. 12 Lines 26-31),

viii. the data movement control part executing control, when the host adapter receives an access control command to specify an access operation to a first logical device included in the plurality of logical devices, to move data associated with the first logical device among a plurality of *storage devices* included in the plurality of kinds of storage devices, according to the content of the specified access operation (Col. 10 Lines 37-46).

ix. Johnson does not disclose a *plurality of kinds* of storage devices, only a plurality of storage devices. Nambu teaches a plurality of kinds of storage devices (Col. 2 Line 64 – Col. 3 Line 2), to be used in a data backup system (Col. 1 Lines 48-49, Abstract). Johnson and Nambu both disclose data storage backup systems, and Nambu teaches that the benefit of using a plurality of kinds of storage devices in such a system is to increase the cost/performance ratio of the system (Col. 3 Lines 11-14). It therefore would have been obvious to one of ordinary skill in the art to have used Nambu's plurality of kinds of storage devices in Johnson's data storage backup system.

3. Claims 2-5, 9, 10, 13, 14, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 6,732,230) in view of Nambu (US 6,826,665) and further in view of Kitamura et al (US 6,658,541).

b. As for claim 2 Johnson et al. and Nambu disclose the *disk array apparatus* (see Paragraph b of this office action), but do not disclose that the disk array apparatus wherein the access control command has a data manipulation preventing function.

c. Kitamura teaches a storage array wherein the access control command has a data manipulation function (Col. 6 Lines 1-15). The inventions of Johnson et al, Nambu and Kitamura et al. are all storage systems for and connected to a host. It would have been obvious to one of ordinary skill in the art to combine the access control command of Kitamura et al with the disk array apparatus of

Johnson et al. and Nambu because Kitamura's access control command provides a way to increase the efficiency of the system (Kitamura – Col. 2 Lines 6-10).

d. As for claim 3 Nambu teaches the disk array apparatus wherein the plurality of kinds of storage devices include a first storage device having a first attribute and a second storage device having a second attribute (Col. 2 Line 64 – Col. 3 Line 2, Col. 3 Lines 5-11).

e. As for claim 4 Kitamura teaches the disk array apparatus wherein the data movement control part moves data stored in the first storage device to the second storage device when an access operation relative to the data is limited by an access control command (Col. 6 Lines 1-7, also Johnson et al. Col. 6 Lines 29-34).

f. As for claim 5 Kitamura teaches the disk array apparatus wherein the data movement control part moves the data stored in the second storage device to the first storage device when limitation of the access operation relative to the data is released by the access control command (Col. 6 Lines 8-14).

g. As for claim 9 Kitamura teaches the disk array apparatus wherein a management table which temporarily manages a limitation content of the access operation when the host adapter receives the access control command is constructed in the control memory, the data movement control part controlling movement of the data by referring to the management table (Col. 6 Lines 15-24).

- h. As for claim 10 Johnson discloses the disk array apparatus wherein the access control command controls the access operation in units of logical devices created on the basis of storage areas of the plurality of kinds of storage devices, the data movement control part moving data in units of the logical devices (Col. 10 Lines 37-56).
- i. As for claim 13 Nambu teaches the disk array system wherein the first storage device is a storage device having a relatively higher performance, while the second storage device is a storage device having a relatively lower performance (Col. 5 Lines 19-26, Col. 1 Lines 61-65).
- j. As for claim 14 Johnson discloses the disk array system wherein the first storage device is an internal storage device existing inside the disk array apparatus, while the second storage device is an external storage device existing outside the disk array apparatus (Fig. 3A Items 100 & 22a-22d, Col. 10 Lines 25-33 – A LAN etc. is disclosed as a means of attachment, which implies the disks 22a-22d are located externally).
- k. As for claim 16 Johnson discloses a control method for
 - x. a disk array apparatus including a host adapter for transferring data between a host system and the disk array apparatus (Col. 10 Lines 12-15 – The processor is a host, and it is in communication with the storage system, therefore a host adapter exists), a cache memory for storing data written from the host adapter (Fig. 3A Item 20, Col. 9 Lines 55-59, Col. 10 Lines 12-15), a storage device adapter for executing control to write data

to the cache memory or to read data from the cache memory (Col. 10 Lines 20-27 – The associated computer processor acts as a SD adapter), a control memory to which control information is to be written by the host adapter and the storage device adapter (Fig. 3A Item 20, Col. 9 Lines 55-59, Col. 10 Lines 12-15 – Memory 20 acts as both a control memory and a buffer, additionally a separate buffer is disclosed but not pictured.), a first storage device and a second storage device to which data are to be written on the basis of control by the *storage device adapter* (Col. 10 Lines 25-27, 37-53), the host adapter creating a plurality of logical devices on the basis of storage areas of the first and second storage devices and executing control to cause the plurality of logical devices to be objects to be accessed from the host system (Col. 10 Lines 37-56), the control method comprising:

- xi. a moving step of *moving* the data from the first storage device to the second storage device (Col. 10 Lines 37-46).
- xii. Johnson fails to disclose:
 - (1) The first and second storage devices having different respective attributes;
 - (2) a reception decision step of determining whether an access control command indicative of an access operation to a first logical device included in the plurality of logical devices has been received from the host system;

(3) the moving step depending on the access operation to data associated with the first logical device is limited by the access control command;

(4) and a restoring step of restoring the data moved to the second storage device to the first storage device when limitation of the access operation is released by the access control command.

xiii. Nambu teaches a first and second storage devices having different respective attributes (Col. 2 Line 64 – Col. 3 Line 2), to be used in a data backup system (Col. 1 Lines 48-49, Abstract). Johnson and Nambu both disclose methods for controlling data storage backup systems, and Nambu teaches that the benefit of using a plurality of kinds of storage devices in such a system is to increase the cost/performance ratio of the system (Col. 3 Lines 11-14). It therefore would have been obvious to one of ordinary skill in the art to use Nambu's plurality of kinds of storage devices in Johnson's method for controlling a data storage backup system.

xiv. Kitamura teaches:

(5) a reception decision step of determining whether an access control command indicative of an access operation to a first logical device included in the plurality of logical devices has been received from the host system (Col. 6 Lines 1-2);

(6) the moving step depending on the access operation to data associated with the first logical device is limited by the access control command (Col. 6 Lines 1-8);

(7) and a restoring step of restoring the data moved to the second storage device to the first storage device when limitation of the access operation is released by the access control command (Col. 6 Lines 8-14).

xv. The inventions of Johnson et al, Nambu and Kitamura et al. are all storage systems for and connected to a host, with associated methods of control. It would have been obvious to one of ordinary skill in the art to combine the access control command and the method of use thereof of Kitamura et al with the method of controlling a disk array apparatus of Johnson et al. and Nambu because Kitamura's access control command provides a way to increase the efficiency of the system (Kitamura – Col. 2 Lines 6-10).

I. As for claim 20 Johnson discloses the control method wherein the access control command controls the access operation in units of logical devices created on the basis of storage areas of the storage devices, each of the moving step and the restoring step moving data in units of the logical devices (Col. 10 Lines 37-56).

4. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 6,732,230) in view of Nambu (US 6,826,665) and further in view of Kitamura et al (US 6,658,541) and Katsuragi et al. (US 2002/0184443).

m. As for claim 6 the depended claim 5 is disclosed by Johnson/Nambu/Kitamura (see Paragraph g. of this office action). Kitamura teaches a disk array apparatus wherein when an access operation relative to the data stored in the first storage device is limited by an access operation relative to the data stored in the first storage device is limited by an access control command, the data movement control part moves the data to the second storage device (Paragraph 6 Lines 1-8).

n. Johnson/Nambu/Kitamura do not disclose that the movement of data occurs after a preset predetermined time has elapsed. Katsuragi teaches waiting a predetermined period of time before writing data (Paragraph 0063), in a disk array apparatus (Paragraph 0002). It would have been obvious to one of ordinary skill in the art to combine the waiting to write from Katsuragi with the disk array apparatus of Johnson/Nambu/Kitamura because it would decrease the likelihood of a write conflict (Katsuragi Paragraph 0063).

o. As for claim 17 the depended claim 16 is disclosed by Johnson/Nambu/Kitamura (see Paragraph l. of this office action). Kitamura teaches the method for a disk array apparatus wherein the moving step moves the data stored in the first storage device from the first storage device to the

second storage device when the access operation relative to the data is limited by the access control command (Paragraph 6 Lines 1-8).

- p. Johnson/Nambu/Kitamura do not disclose that the movement of data occurs after a preset predetermined time has elapsed. Katsuragi teaches waiting a predetermined period of time before writing data (Paragraph 0063), in a disk array apparatus (Paragraph 0002). It would have been obvious to one of ordinary skill in the art to combine the waiting to write from Katsuragi with the method for a disk array apparatus of Johnson/Nambu/Kitamura because it would decrease the likelihood of a write conflict (Katsuragi Paragraph 0063).
5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al. (US 6,732,230) in view of Nambu (US 6,826,665) and further in view of Kitamura et al (US 6,658,541) and Matsunami et al. (US 2002/0095549).

q. As for claim 11 the depended claim 5 is disclosed by Johnson/Nambu/Kitamura (see Paragraph g. of this office action). They do not disclose, however, that the access control command includes at least one of a write inhibit command and a write and read inhibit command.

r. Matsunami et al. disclose both a write inhibit command and a write and read inhibit command used in a disk array apparatus (Paragraph 0091). It would have been obvious to one of ordinary skill in the art to combine Matsunami et al's write and read/write inhibit command with the disk array apparatus of Johnson/Nambu/Kitamura because doing so would maintain order and ensure data consistency (Matsunami Paragraph 0091).

Allowable Subject Matter

6. Claims 7, 8, 12, 15, 18, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

s. Claims 7, 8, 12, 15, 18 and 19 contain at least the allowable subject matter of a first access control command which applies a relatively larger limitation to the access operation and a second access control command which applies a relatively smaller limitation to the access operation.

Conclusion

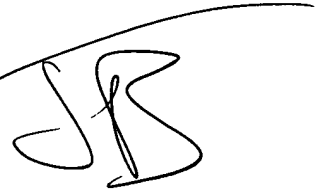
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Barton whose telephone number is 571-272-8157. The examiner can normally be reached on Monday - Friday 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2186

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jonathan Barton
Examiner
Art Unit 2186

A handwritten signature in black ink, appearing to be 'JB' with a long horizontal stroke extending to the right.

JB

A handwritten signature in black ink, appearing to be 'M. Anderson' with a long horizontal stroke extending to the right.

MATTHEW D. ANDERSON
PRIMARY EXAMINER